



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,028	06/15/2006	Harue Nakashima	0756-7743	9196
31780	7590	06/22/2009	EXAMINER	
ERIC ROBINSON			CLARK, GREGORY D	
PMB 955			ART UNIT	
21010 SOUTHBANK ST.			PAPER NUMBER	
POTOMAC FALLS, VA 20165			1794	
			MAIL DATE	DELIVERY MODE
			06/22/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/583,028

Applicant(s)

NAKASHIMA ET AL.

Examiner

GREGORY CLARK

Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-44 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/DE)
Paper No(s)/Mail Date 06/15/2006, 11/23/2007
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

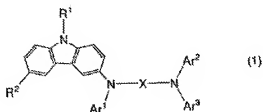
Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

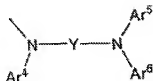
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1, 2, 4-6, 9-10, 13-14, 17-18, 21-22, 25-26, 28-29, 30 and 33-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richter (DE 10203328.5) or (WO 03/064373) . The US PG Pub 2005/0067951 is being relied upon as a direct translation of WO 03/064373.**

3. **Regarding Claims 1, 2, 4, 5, 6, 9,10, 13,14 and 28,** The applicant claims a carbazole derivative represented by a general Formula 1 shown below:

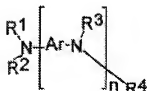


and R2 is selected from the Fragment 2 group shown below:



Fragment 2

Richter discloses a compound used in an electroluminescent device (paragraph 45) represented by Formula 3 (abstract) shown below:



Formula 3

Richter discloses the following about Formula 3 (abstract):

- n is 1 to 10
- R¹-R⁴ can be the same or different represented by phenyl, biphenyl, methylphenyl, naphthyl, phenanthrenyl, anthracenyl, fluorenyl, tri-arylmethyl-aryl or triarylsilyl-aryl.
- Ar represents a biphenylene, triphenylene, tetraphenylene or fluorenylene-type bridge (abstract).

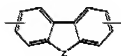
Richter fails to mention where Ar = phenyl.

The examiner takes the position that Formula 3 disclosed by Richter differs from the applicants' Formula 1 in the Ar linking group (phenyl vs. biphenylene or triphenylene). These aromatic linking groups are homologous structures in that they are all aromatic structures based on benzene. The essential difference between the claimed structure and the prior when Ar=biphenyl is the addition of one benzene group. One would

expect that these structures would function in the same way and transfer electron density in the same way via the conjugated benzene based structures.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used a phenyl group in place of the longer biphenyl structures used in Richter with a reasonable expectation of success as these are homologous structures that would be expected to function the same way.

Richter further discloses the R1 to R4 can be represented by Fragment 4 Shown below:



Fragment 4

Fragment 4 is a di-substituted carbazole and Z can be represented by Sub-fragment 1 (shown below):



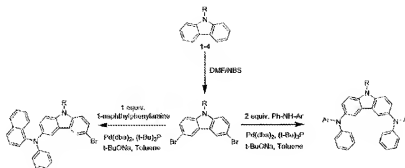
Sub-fragment 1

Where R⁹ can be H or alkyl 1-5 carbons (paragraphs 38 and 39).

4. **Regarding Claim, 17, 21, 25, 29, 33, 34, 35, 36, 37, 38, 39, 40,** Richter discloses an organic compound (Formula 3 shown above) (a carbazole material paragraphs 38 and 39) located between two electrodes (paragraph 48). The organic compound is located in the hole transport layer which is located next to the anode (paragraphs 48 and 50).

5. **Regarding Claims 18, 22, 26, 30** Richter shows that the carbazole nitrogen can be substituted with H or alkyl 1-5 carbons (paragraphs 38 and 39).
6. **Regarding Claim 41-44**, Richter fails to disclose the specific use of the electroluminescent devices. The examiner takes the position that it is well known in the art to use electroluminescent devices host of electronic devices which would include those claimed by the applicant.
7. **Claims 3-4, 7-8, 11-12, 15-16, 19-20, 23-24, 27-28 and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richter (DE 10203328.5) in view of Thomas (J. Am. Chem. Soc., 123, 9401-9411) and further in view of Brunner (2006/0073357).**
8. **Regarding Claims 3, 7, 11, 15, 19, 23, 27, 31**, Richter disclose a carbazole group with a single substituent one each phenyl ring. While Richter teaches a carbazole (Fragment 4) bonded to Formula 3, he fails to teach a carbazole group where the R2 position is substituted with a H or tert-butyl group.

Thomas discloses that carbazole derivatives used in electroluminescent devices can be made by a reaction with N-bromosuccinimide (NBS) to make di bromo carbazoles (Scheme 1):



Similarly Brunner discloses that the mono bromo carbazole derivatives used in electroluminescent devices can be made in a similar manner by reducing the molar quantity of NBS in the above bromination reaction (paragraphs 141-142). A subsequent reaction with the desired benzidine fragment would result in a mono benzidine substituted carbazole ($\text{R}_2 = \text{H}$).

The examiner takes the position that the emissive properties of carbazoles substituted with a benzidine group (Fragment 2, above) is well known in the art. Richter discloses a di-substituted carbazole but not a mono substituted carbazole. The emissive properties of the mono and di substituted carbazoles would be the same or similar in nature, absent unexpected results.

With a reasonable expectation of success at the time of the invention a synthetic chemist would make a variety of substituted carbazoles which would include the mono and di carbazole species through well known synthetic routes used to prepare organic compounds useful in electroluminescent devices.

Art Unit: 1794

9. **Regarding Claims 4, 8, 12, 16, 20, 24, 28, 32** Richter shows that R1-R4 from Formula 3 (shown above) can be the same or different represented by phenyl, biphenyl, methylphenyl, naphthyl, phenanthrenyl, anthracenyl, fluorenyl, tri-aryl/methyl-aryl or triarylsilyl-aryl.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY CLARK whose telephone number is (571)270-7087. The examiner can normally be reached on M-Th 7:00 AM to 5 PM Alternating Fri 7:30 AM to 4 PM and Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art Unit 1794

GREGORY CLARK/GDC/
Examiner
Art Unit 1794